

Application No. 10/082,603

REMARKS

Claims 1-20 are pending. Claims 1 and 18 are amended for clarity. Applicants do not intend to narrow the claims by the amendment. No new matter is introduced by the amendments.

All of the pending claims stand rejected. Applicants respectfully request reconsideration of the rejections based on the following analysis.

Rejection Over Yamada in view of Chen

The Examiner rejected claims 1-2, 4, 6-10, 12, and 14-16 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No 5,940,548 to Yamada et al. (Yamada) in view of U.S. Patent No. 6,356,681 to Chen et al. (Chen). Applicants maintain that the teachings of Chen are not relevant to the teachings of Yamada. Thus, Applicants assert that the Examiner has failed to establish *prima facie* obviousness. Applicants respectfully request reconsideration of the rejection in view of the following comments.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." MPEP § 2142 (citing *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

The Yamada patent teaches arrayed waveguide gratings in which the optical path length is primarily adjusted through the use of a phase adjusting plate. See abstract and throughout. As noted by the Examiner, Yamada has a vague statement at column 14, lines 42-44 indicating a step in their process of "Irradiate each arrayed waveguide with laser light to change the refractive

Application No. 10/082,603

index partially and compensate for phase error." No explanation is offered on how to accomplish this.

The Chen patent is directed to optical fibers in which the fiber is tuned by changing the physical length of the fiber. A laser is used in the Chen process to change the length of the fiber for more precise trimming. See column 4 and equation 1 of Chen. The laser functions as a localized heat source. See, for example, column 3, lines 52-66. The second embodiment of Chen is discussed below. Thus, neither Yamada or Chen teach the concept of controlling the optical path length using a laser to change the index of refraction while achieving control of the optical path length within 10 nanometers through control of the index of refraction. Since this feature of Applicants' claimed invention is not disclosed in the cited references, the combined teachings of the cited references do not render Applicants' claimed invention *prima facie* obvious. Furthermore, the Examiner has failed to supply suitable motivation or a reasonable expectation of success for the combination, but these issues are interrelated to the shortcomings of the cited references with respect to use of index variation to control the optical path length within 10 nanometers.

With respect to claims 16 and 17, since the methods of the Chen patent are not suitable for the adjustment of planar arrayed waveguide gratings, there would be no reasonable expectation of success with respect to the formation of the claims structures of claims 16 and 17. Thus, the combined teachings of the cited references similarly do not render claims 16 and 17 *prima facie* obvious.

On page 7 of the Office Action, the Examiner argued that the availability of the second embodiment of Chen relating to diffusion of dopant refuted several of Applicants' arguments. With all due respect, Applicants disagree. There is no teaching in the cited references that diffusion of dopant can be used to change the index of refraction of a planar waveguide. Thus, the suggest combination proposed by the Examiner does not provide a reasonable expectation of

Application No. 10/082,603

success. If there is no reasonable expectation of success, the combined teachings do not establish *prima facie* obviousness.

Since the combined teachings of the cited references do not render Applicants' claimed invention *prima facie* obvious, Applicants respectfully request withdrawal of the rejection of claims 1-2, 4, 6-10, 12, and 14-16 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Chen.

With respect to specific features noted by the Examiner in the claims depending from claims 1, 9, and 16, these issues are not commented on further here, except for the issues regarding **ultraviolet laser light**, because they are presently moot given the above analysis, although Applicants do not acquiesce in the Examiner's position. See MPEP § 2143.03 ("If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.")

With respect to the Examiner's assertions regarding **ultraviolet light**, the Chen patent teaches away from these assertions. In particular, Chen teaches that UV light cannot be used to change the index of refraction after the glass is annealed. See, column 1, lines 38-46. Chen teaches the use of visible (He-Ne) laser light (Fig. 2) or infrared CO<sub>2</sub> laser light Fig. 2 and Col. 3, lines 57-58). There is no teaching in Chen that would indicate that UV light would be suitable for processing the planar structures in Yamada. Applicants respectfully request withdrawal of the rejection of claims 3, 5, 11, 13 and 17 as being unpatentable over Yamada in view of Chen.

#### Rejection Over Yamada in view of Chen and Dugan

The Examiner rejected claims 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Chen and further in view of U.S. Patent Application Publication No. 2003/0035640 to Dugan et al. (Dugan). The Examiner cited Dugan for teaching the use of a pulsed laser to change the index of refraction. Applicants maintain that the combined teachings

Application No. 10/082,603

of the references do not render Applicants' invention *prima facie* obvious. Applicants respectfully request reconsideration of the rejection in view of the following comments.

With respect to claim 18, as described above, the combined teachings of Yamada and Chen do not teach or suggest modifying the optical path length of a planar waveguide within an AWG within 10 nanometers through modification of the index of refraction. Similarly, these references do not provide a reasonable expectation of success with respect to the claimed invention. Furthermore, Dugan does not make up for these deficiencies. In particular, Dugan does not provide a reasonable expectation of success with respect to the adjustment of the optical path length of a planar waveguide within an AWG within 10 nanometers. Thus, the combined teachings of the cited references do not render Applicants' claimed invention *prima facie* obvious. Applicants respectfully request withdrawal of the rejection of claims 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Chen and further in view of Dugan.

With respect to specific features noted by the Examiner in the claims depending from claim 18, these issues are not commented on further here because they are presently moot given the above analysis, although Applicants do not acquiesce in the Examiner's position.

#### Conclusions

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

Application No. 10/082,603

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



Peter S. Dardi, Ph.D.  
Registration No. 39,650

Customer No. 62274  
Dardi & Associates, PLLC  
2000 U.S. Bank Plaza  
220 South 6th Street  
Minneapolis, Minnesota 55402  
Telephone: (404) 949-5730